SANTA CRUZ BIOTECHNOLOGY, INC.

Dnmt1 siRNA (h): sc-35204

BACKGROUND

Methylation at the 5'-position of cytosine is the only known naturally occurring covalent modification of the mammalian genome. DNA methylation requires the enzymatic activity of DNA 5-cytosine methyltransferase (Dnmt) proteins, which catalyze the transfer of a methyl group from S-adenosyl methionine to the 5'-position of cytosines residing in the dinucleotide CpG motif, and this methylation results in transcriptional repression of the target gene. The Dnmt enzymes are encoded by independent genes. Dnmt1 is the most abundant, and it preferentially methylates hemimethylated DNA and coordinates gene expression during development. Additional mammalian Dnmt proteins include Dnmt2 and Dnmt3. Dnmt2 lacks the large N-terminal regulator domain of Dnmt1, is expressed at substantially lower levels in adult tissues, and is likely involved in methylating newly integrated retroviral DNA. Dnmt3a and Dnmt3b are encoded by two distinct genes, but both are abundantly expressed in embryonic stem cells, where they also methylate CpG motifs on DNA.

CHROMOSOMAL LOCATION

Genetic locus: DNMT1 (human) mapping to 19p13.2.

PRODUCT

Dnmt1 siRNA (h) is a target-specific 19-25 nt siRNA designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Dnmt1 shRNA Plasmid (h): sc-35204-SH and Dnmt1 shRNA (h) Lentiviral Particles: sc-35204-V as alternate gene silencing products.

STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 µl of the RNAse-free water provided. Resuspension of the siRNA duplex in 330 µl of RNAse-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

Dnmt1 siRNA (h) is recommended for the inhibition of Dnmt1 expression in human cells.

SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 µM in 66 µl. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

GENE EXPRESSION MONITORING

Dnmt1 (H-12): sc-271729 is recommended as a control antibody for monitoring of Dnmt1 gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Dnmt1 gene expression knockdown using RT-PCR Primer: Dnmt1 (h)-PR: sc-35204-PR (20 µl, 352 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Lee, J., et al. 2005. Hepatitis B virus X protein represses E-cadherin expression via activation of DNA methyltransferase 1. Oncogene 24: 6617-6625.
2. Mabaera, R., et al. 2008. Neither DNA hypomethylation nor changes in the kinetics of erythroid differentiation explain 5-azacytidine's ability to induce human fetal hemoglobin. Blood 111: 411-420.
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4. Hervouet, E., et al. 2011. Proximity ligation *in situ* assay for monitoring the global DNA methylation in cells. BMC Biotechnol. 11: 31.
5. Zhu, A., et al. 2012. MicroRNA-148a is silenced by hypermethylation and interacts with DNA methyltransferase 1 in gastric cancer. Med. Oncol. 29: 2701-2709.
6. Zuo, J., et al. 2013. MicroRNA-148a can regulate runt-related transcription factor 3 gene expression via modulation of DNA methyltransferase 1 in gastric cancer. Mol. Cells 35: 313-319.
7. Qin, L., et al. 2014. Reversible epigenetic regulation of 14-3-3σ expression in acquired gemcitabine resistance by UHRF1 and DNA methyltransferase 1. Mol. Pharmacol. 86: 561-569.
8. Duraisamy, A.J., et al. 2018. Epigenetics and regulation of oxidative stress in diabetic retinopathy. Invest. Ophthalmol. Vis. Sci. 59: 4831-4840.
9. Mishra, M. and Kowluru, R.A. 2019. DNA methylation—a potential source of mitochondria DNA base mismatch in the development of diabetic retinopathy. Mol. Neurobiol. 56: 88-101.
10. Duraisamy, A.J., et al. 2019. Mitochondrial fusion and maintenance of mitochondrial homeostasis in diabetic retinopathy. Biochim. Biophys. Acta Mol. Basis Dis. 1865: 1617-1626.
11. Parbin, S., et al. 2019. DNA methylation regulates Microtubule-associated tumor suppressor 1 in human non-small cell lung carcinoma. Exp. Cell Res. 374: 323-332.

RESEARCH USE

For research use only, not for use in diagnostic procedures.